National Gypsy Moth Slow the Spread Program
2019 Accomplishment Report

Summary: The National Gypsy Moth Slow the Spread Program (STS) continues to successfully reduce the rate of spread of European gypsy moth by **>60%** with the cooperation of **11 states** (IL, IN, IA, KY, MN, NC, OH, VA, TN, WV, and WI), two universities, the Slow the Spread Foundation, and USDA Forest Service and APHIS. In 2019, approximately **255 people** collaborated to monitor gypsy moth populations with **61,718 traps** and treat **135 new populations** expanding from quarantined areas. STS treated **297,025 acres** with biological pesticides [*Bacillus thuringiensus kurstaki* (*Btk*): 38,365 acres, Gypsy moth nucleopolyhedrosis virus (Gypchek): 112 acres, and mating disruption (SPLAT GM-Organic): 258,548 acres], representing **91% of private lands** and 9% of federal lands. Treatment **success was 94%** for mating disruption and *Btk* applications evaluated in 2019. For additional information from 2019, visit the STS Accomplishments Story Map.

Project Area: The STS program area covers approximately 2.3 million square miles across 11 states, comprised of the action area and two monitoring zones (I and II) (Fig. 1). Suppression treatments primarily occurred in the 100 km wide action area.

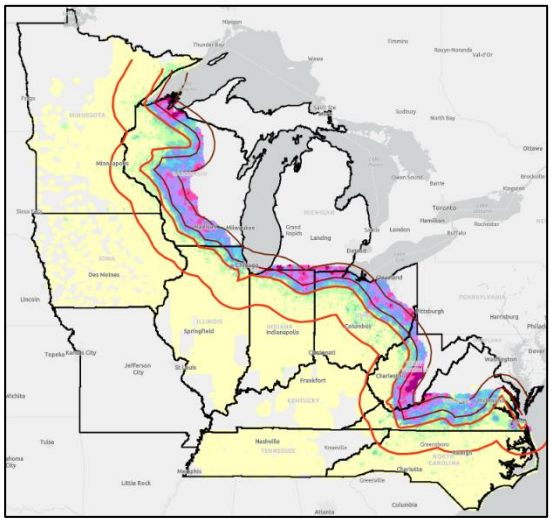

Figure 1. Program boundaries [action area (red lines), monitoring zone I (maroon line) and II (brown line)] implemented and gypsy moth populations monitored in 2019 by STS. Cooler colors represent higher population growth.

Partners: State agricultural and natural resource agencies manage and implement trapping and treatment programs and contract *Btk* applications. Two databases, located at Virginia Polytechnic Institute and State University and Michigan State University, coordinate uniform trapping programs and data collection, maintain the www.gmsts.org website, develop software to support trapping programs, and preserve current and historical data. The STS Foundation disperses federal funds to states for trapping and treatment work, contracts trappers for survey programs, and purchases products for mating disruption applications. The STS Foundation Board of Directors directs and annually approves budgets and program plans. USDA Forest Service provides a Program Manager and support staff to manage and disperse funds to the STS Foundation, coordinate and assist the planning of trapping and treatment programs, and direct mating disruption applications. USDA APHIS supports trapping at regulatory sites, coordinates detection trapping adjacent to the STS program, and supports mating disruption applications. All partners provide technical expertise for the program.

Monitoring: Two trap types (delta and milk carton) were used to detect new infestations of gypsy moth in the action area (56,430 traps) and monitor population growth and spread rates in the monitoring zone I and II (5,288 traps) (Fig. 1). Traps were monitored from April to October across the program area with 95% accuracy for trap location, placement and removal timing. Fourteen percent (14%) of traps were inspected to verify trapping procedures. Delimiting traps were monitored on 425 blocks in 2019 to define treatment block boundaries, guide management options, and evaluate treatment success. Trapping and database costs represented approximately 55% of the annual program budget.

Treatments: Treatment blocks were strategically planned according to trap catch data, the STS decision algorithm, and expertise knowledge from state and federal personnel. All treatments were environmentally reviewed and approved prior to implementation. Mating disruption and larvacides (*Btk*, Dimilin, and Gypchek) were applied on 297,025 acres during late spring and early to mid-summer across eight

states (Table 1). Mating disruption costs ranged from $7 to 11 per acre, representing years of research to refine treatment costs, and target treatment blocks with <60 male moth catches. A single application of *Btk* ranged from $20 to 60 per acre and targeted treatment blocks with either >60 male moth catches or when life stages were detected. Treatments were coordinated with federal lands (George Washington and Jefferson and Wayne National Forests, Blue Ridge Parkway, and John Kerr Reservoir), The Wilds–Columbus Zoo, metropolitan areas of Chicago, Columbus, and Minneapolis, and private land owners. Treatment success evaluated for 2018 mating disruption applications was 82%, 12% had partial success, and 6% failed, representing slightly higher success than the previous year. Treatment success evaluated for 2019 *Btk* applications was 83%, comparable to 2018 applications, 11% had partial success, and 6% failed. No failures (100% successful) were found for combined *Btk* – mating disruption applications. Treatment costs represented 42% of the annual program budget in 2019.

Table 1. Acres treated by STS in 2019 on state and federal lands.

State	Blocks treated	Treated acres	
		Larvacides (Btk &GypChek)	**Mating Disruption** (SPLAT GM-O)
IA	3	0	8,480
IL	3	5,985	0
IN	5	1,470	5,792
MN	3	120	0
NC	1	0	1,095
OH	51	6,727	69,237
VA	26	4,235	71,401
WI	44	19,575	77,271
Fed. lands	-	253	25,272
TOTAL	**135**	**38,365**	**258,548**

Technology Development: STS collaborated with several researchers to improve mating disruption applications (K. Onufrieva); assess factors driving population growth, evaluate the efficacy of STS treatments, and assess non-target effects of *Btk* applications (J. Walter and D. Johnson); and assess the variation of developmental traits along the invasion front (D. Parry and K. Grayson). Technology development represented 3% of the annual budget.

Regulatory Program: Five state partners (IL, MN, VA, WV, and WI) within the STS program conduct regulatory activities (industry and public awareness; identify and monitor high-risk sites within STS; establish compliance agreements to facilitate commerce; and document and evaluate new issues) to identify isolated gypsy moth infestations that occur as a result of artificial spread. States presented gypsy moth awareness information at 69 outreach events, including radio programs, professional tree care organizations, and trade shows, certified and maintained hundreds of compliance agreements, and performed hundreds of inspections for life stages and emerging issues. APHIS provides the funding for these activities, which are tracked using APHIS and STS's protocols.

Funding: The operating budget for STS increased ($324,000) from 2018 to 2019.

USDA Forest Service	Operations	$7,684,000
	Technology Development	$110,000
State Partners		$2,087,548
APHIS		In-kind contributions*
TOTAL		**$9,771,548**

*APHIS provides the ability to purchase trapping supplies (traps, lures, etc.) at a lower cost, saving >$100,000; verifies chemical purity and accuracy of racemic disparlure (active ingredient in mating disruptant) and mating disruptant (SPLAT GM-Organic); and stores racemic disparlure until use.

Spread: The mean spread rate of gypsy moth in 2019 was negative (-2.03 km/yr) and the three-year average rate of spread was -4.6 km/yr, surpassing STS's goal of reducing the rate of spread by >60%. The rate of spread continues to be the fastest in the Southern and Northern Regions of STS (2.75 and 1.08 km/yr, respectively), but still under the goal of 7.8 km/yr rate of spread. The Central Region had the slowest rate of spread in 2019 (-9.15 km/yr).

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